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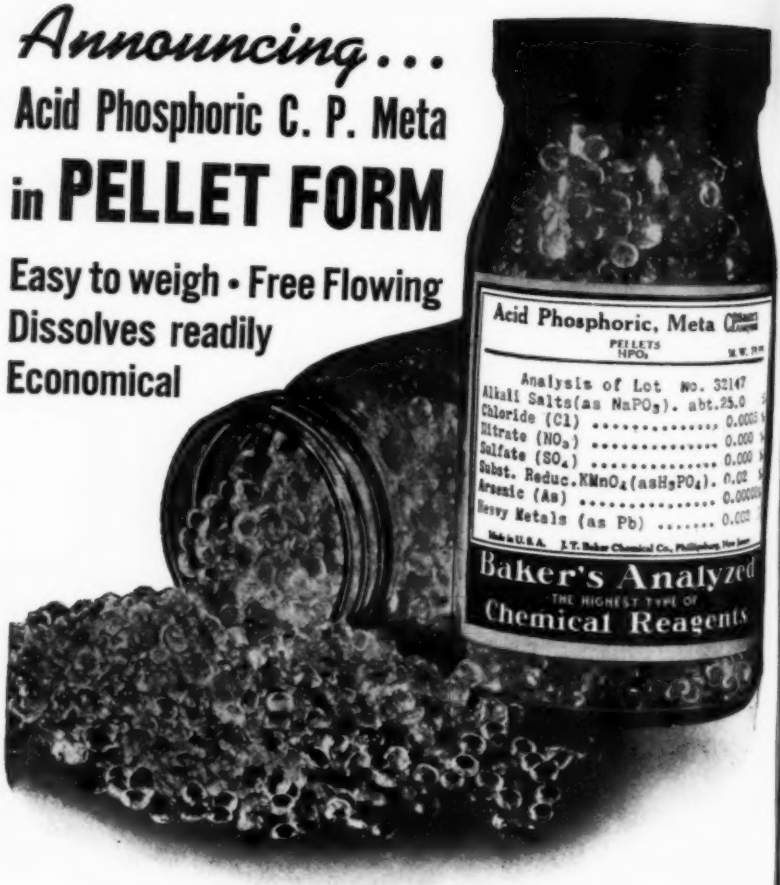

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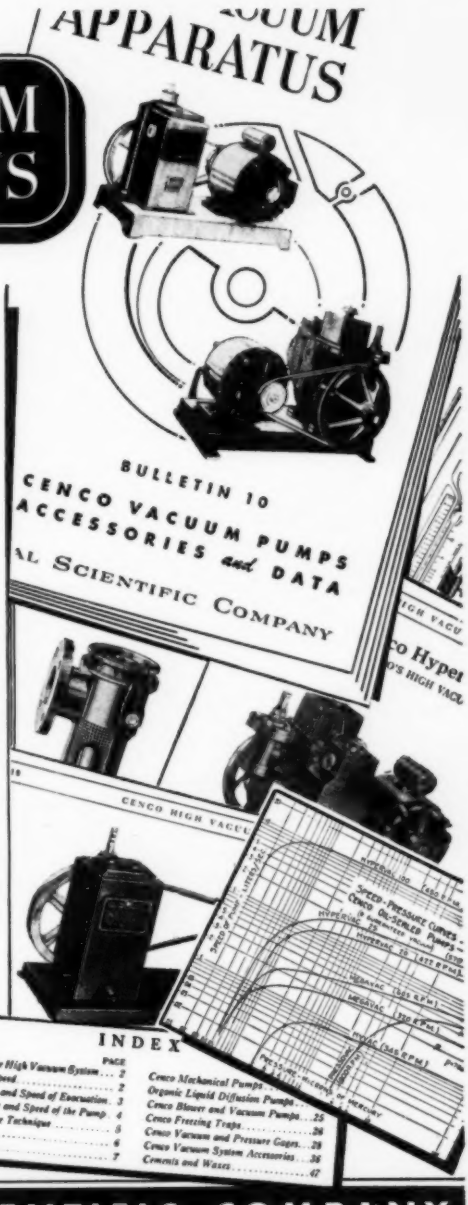

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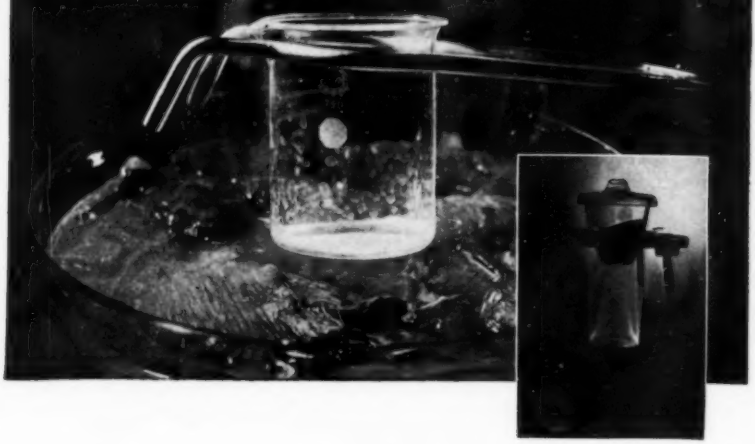

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Research and Human Welfare

Dr. M. L. Crossley, F.A.I.C.

Director of Research, American Cyanamid Company

THERE is nothing miraculous about research. It is a systematic search for facts, which when correlated and evaluated, helps to answer the ordinary questions of what, how, and why, constantly arising in life. These are the word-magnets that select out ideas for original thinking and creative work. In dealing with such questions, facts must be weighed in the balance of experience and their values assessed in terms of their significance in relation to what is already known. The past and the present are two phases of the same continuity. The new and the old must fit together into a pattern of thought capable of satisfying the demands of the present. Yesterday's knowledge is never good enough to solve the problems of today. The meaning of facts in being synthesized into knowledge depends upon the frames of reference used. There are no unchangeable standards by which to measure new facts. When the new do not fit logically into the old frames of reference, one must create such frames of reference as will give the most satisfactory results. This is originality without which little of real value is accomplished in research.

The knowledge required for the solution of problems in chemical research, of particular concern to me, is a composite of many factors. The more complex the problem the greater the need for evidence secured from different and varied sources. Few, if any, problems are wholly chemical or physical. They usually involve elements of both. Besides, there is always the question of the importance of the problem at the time, in comparison with other problems pressing for solution. This question is not answerable with scientific knowledge alone. There are social and economic consequences to be considered. These are not expressed in chemical formulas and quadratic equations. The spectral curves may enable us to identify and classify colors but they do not express our sense of beauty involving a blend of colors. Definite chemical reactions may be responsible for certain physiological and psychological phenomena underlying human behavior, but these reactions alone do not convey to us any understanding

or appreciation of that behavior in terms of values applicable to human relationships. Adrenalin may be involved in the emotion of love but it isn't love.

In trying to unravel the complex reactions in the cycle of events in living organisms, one finds interwoven strands of different phenomena, the significance of which transcends the knowledge obtained from chemical, physical, and biological facts. Such facts must be supplemented by a broad proficiency of knowledge to lead us to an understanding of the phenomena and an intelligent interpretation of their meaning. The synthesis of an organic compound is one thing; its potential power to regulate specific processes in cellular growth and activity, thus contributing to the maintenance of health, quite another. Peacock blue, rose pink, and the entire pageantry of color, possible with synthetic dyes and pigments, become available as a result of fundamental knowledge of molecular architecture and its influence on the absorption of light energy by chemical compounds, but the contributions of these to human welfare depend upon their capacity to satisfy the human desire for beauty in physical surroundings. The beauty and charm of the modern girl, from shoes to rouge, depend largely upon organic syntheses, reaction kinetics and energy levels, but the application of the resulting products to her needs involves art as well as science. As a result of research the demands of beauty in the arts can now be satisfied without drawing on the bounty of nature.

Qualities Needed In Research

Scientific research reveals the essential features of the structure and properties of matter, and technology fashions these discoveries into agencies capable of promoting human welfare. Both fundamental research and development are essential; they are interdependent. It is difficult, if not impossible, to draw a sharp line of distinction between research and development. In general, the former provides the basic knowledge which the latter translates into industrial "know-how". Research becomes infected with the virus of practicability without acquiring immunity against originality. Its assumed purity remains undefiled in its relation to practical aims. Research conducted with the limited aim of obtaining information in a special field, without any desire or obligation to try to understand the significance of the results in relation to existing knowledge, is neither pure nor useful. Masses of uncorrelated data add little, if anything, to the sum of knowledge. Considerable waste in thought and human energy results from the mistaken idea that there is, and of necessity must be, an unreconcilable conflict between original thinking and purposeful endeavor. Research for research sake is meaningless unless it

implies that some contribution is being made to the sum of knowledge which contributes to the general advancement of mankind.

The desire to know is the driving power of research, pushing one beyond the boundaries of the known to obtain a vision of what he would create and then will to make a reality. The result can be no greater than one's capacity to visualize it. To dream is essential. To make dreams come true is imperative. This involves disciplined imagination, originality and the will to try, supported by faith great enough to supply the courage to keep on trying in spite of failures. Imagination is that Divine Gift making it possible,

"To see a world in a grain of sand,
and a heaven in a wild flower,
Hold infinity in the palm of your hand,
And eternity in an hour."

Keenness of perception and a highly developed sense of values are absolutely essential in scientific research. Every problem that is solved opens up new vistas of challenging possibilities enabling one to catch a vision of the potentialities of his work beyond the exacting details and to become inflamed with curiosity and determination. This is essential if he would soar to the lofty heights where only the most sublime and rare thoughts dwell. It is only when one reaches up to the highest peaks of endeavor, determined to face obstacles, that he has a chance for success in creative work. Such heights are not reached without a struggle, requiring endurance and perseverance. Every success in research comes through a Gethsemane of trial.

The will to succeed is of prime importance. It is nourished by ideals which shape judgments and intensify purpose. Facts alone do not have the power to sustain interest and compel effort. One must develop a philosophy of life in which the ideal of individual moral responsibility for excellence in work prevents his ever becoming a disinterested individual working out a life sentence in a job. Research men must believe in the dignity of work and wish to make the greatest possible impress on life. They must keep always in the forefront of consciousness the belief that "men can do all things if they will". Their education should enable them to build the foundation from which they can get a "constant vision of greatness". While thinking and working with ions, electrons, and genes, they must be interested in helping to establish proper human relationships.

Interest in maintaining such a philosophy must be constantly kindled and fanned into a conflagration of joyful effort by inspiring leadership. This leadership should help men to rise above their limitations and achieve a measure of success far beyond their ordinary powers of accomplishments. Men must be aroused to that degree

of interest which alone can sustain the fires of ambition and compel action. They must be encouraged to want to find out the meaning of the facts they obtain. They must not stop with having found out what things are and how they came about but must keep pressing on in the search of why. They must be inspired to want to rise above the limiting influences of the commonplaces in their work and try to see the proper significances of the facts they observe.

The ability to evaluate facts and to interpret their significance is best developed by a broad knowledge of the circumstances surrounding the facts and a sympathetic understanding of the limitations of human observations and judgments. An accumulation of technical information is not sufficient. One must do more than store facts and ideas in mental treasure vaults for safekeeping, if he would be more than a repository of unassorted mental rubbish. This is not thinking; it is simply playing with antique mental toys. One must constantly examine the facts in his possession and select those that are useful at the time in formulating his ideas of the most satisfactory design of that he would create. He must not assign them permanent values. The periodic purging of useless information is just as essential to normal mental activity as is the elimination of metabolic wastes to the well-being of the body. Assimilation without elimination leads, in both cases, to perverted functions.

The Objectives of Research

Research has four major objectives in industry. It must provide new and useful products and processes for supplying the means of social and economic progress. It must obtain fundamental data and interpret them so as to advance both scientific thought and industrial development. It must show how to maintain the quality and efficiency of products and the services they render in order to safeguard the existing investment in the industry. Finally, it must furnish the bases for the selection of the variety of products and things needed to maintain the essential structure of a free and competitive system of economy. All are essential. Not one could we do without. The first assures the continued progress of industry. The second is the stimulating hormone which controls its growth processes. The third protects its developing structure from the dry rot of complacency. And, the fourth is the essential catalyst of free enterprise.

Without research the great accomplishments of technology in this industrial age could not have been realized. It has provided the means for building the foundations of modern civilization. All about us is abundant evidence of the contributions of scientific research to world progress. The delicate fragrance of the flowers;

the colors that brighten and enrich life; the drugs that subdue pain, diminish suffering, minimize the hazards of disease, and prevent premature death; the synthetic fibers giving fabrics of great durability and beauty; the resins and plastics of wide variety and usefulness; and the many other products and things contributing to the fullness of life for the many, all owe their being to research. Out of the common substances of the earth, the chemist evolved substances and things, having no counterpart in nature, capable of contributing greatly to the maintenance of health and prosperity for all mankind. Sulfadiazine, releasing the meningitis victim from the embrace of death, does honor to its ancestor coal. The insulating material that plays an important role in modern means of communication may trace its lineage back to the sand of the seashore. The fluid that soothes the labored breathing of the gasoline engine derives its characteristics from the sea itself. Research sired them all.

The Value of Research

The impact of the results of research on civilization cannot be measured fully in terms of production figures, dollars of sales and net profits. These are minor considerations in comparison with the importance of the service rendered by the products in contributing to human welfare. There is no adequate measure of the sense of well-being that comes from the use of synthetic dyes and pigments in the arts. Synthetic fibers from wood pulp, melamine resins from coal and nitrogen of the air, amber-like products from household disinfectants, gems of beauty from dirty soil, lily-of-the-valley and trailing arbutus perfumes from sticky, smelly tar and oils, enable the modern woman to derive the immeasurable pleasure of not only looking like a flower in Life's garden but at the same time radiating the charm of its fragrancy. Here is a value no financial statement can reveal. Sulfur drugs and antibiotics cure many people of infections from which they would have died before. This is a great triumph. But, the number of human lives saved is not a full measure of the value of these drugs. Far beyond this is the value that results from diminished suffering and the escape from the crippling influences of diseases. The aftermath of an infectious disease is often more serious than the disease itself. The incidence of gonorrheal arthritis, in one clinic alone in this country, in 1937, was 45 per 100,000, while in 1945, after sulfur drug therapy had been employed, it was but two. There is no way to get a satisfactory estimate of the value of the relief from pain and suffering. It must include the value of the relieved anguish of family and friends and the restored economic earning power of the sick made well by the treatment. Likewise, the sav-

ing to the public in electricity and automobile tires can be measured in dollars but the effect of having these at prices within the means of the majority of citizens cannot be estimated. The good is not wholly in economic values.

There is no proper measure of the full import of the advances in electricity on the course of civilization. One can determine the amount of useful energy obtainable from a pound of coal or petroleum and estimate what work it will do, but it is quite another matter to evaluate the gain to society in being able to have electric light and power to use it at will. What means can be used to estimate the value of the results of research on petroleum in its influence on the development of the automobile and the network of concrete highways to make it serviceable? What is the value of the automobile for the health and social well-being of man? Research is indispensable to progress.

The Price of Progress

Progress can not be had for nothing. We are inclined to take the good things of life for granted after they are readily available. Reflection will show that they could not have been realized without the expenditure of large sums of money for research, development, production, and distribution. Many different types of service contribute to the successful result. Behind each potent drug stands a long list of useless products that had to be made to find the few good ones. All had to be studied in animals to get information for evaluating them in terms of their potential effectiveness in treating diseases in humans. This requires the expenditure of much money and involves the work of many people. To have automobiles and airplanes, extensive research had to be done. Means had to be found to make available abundant, cheap gasoline. Materials of construction capable of meeting the most stringent requirements had to be developed. To make possible pleasurable use of these machines, physical, chemical and engineering research developed tires that give more than 400 per cent increase in mileage and cost but a fraction of that of the earlier and poorer products. None of these results could have been possible without profits in industry. The important question is who profited most, industry or the consumer of the products? The evidence points with certainty to the conclusion that the consumer is always the chief beneficiary of research.

Research's Value to Life

One of the most important contributions of scientific research to human welfare is that of unravelling Life's processes and helping to guide man to a fuller realization of his possibilities and responsibilities as a biochemical chip off the human family block. Nothing worthwhile is accomplished

—Courtesy Calco Chemical Division, American Cyanamid Company

Dr. Foster D. Snell, President, presenting the Institute's Gold Medal to Dr. M. L. Crossley, May 2, 1947.

by penetrating to the core of the atom and the heart of the gene unless the knowledge gained improves man himself and makes for a better world in which all peoples can live in peace and harmony. Why increase the span of life unless old age can be made useful and comfortable? Why unchain nuclear forces if they are to be employed to keep people throughout the world in constant fear of death and destruction? A fraction of the attention, thought and activity given to the development of the atomic bomb would solve the problems of cancer, heart disease, tuberculosis, arthritis and the many mal-functions contributing to anti-social behavior. When we know more about the chemistry of the regulatory processes governing man's adjustment to his environment we should be able to treat him for the deficiencies which lead to his atypical responses to environmental conditions. Then the juvenile delinquent and the criminal would be treated with the hormones, enzymes or chemical products which they needed for normal activity and which their cells and glands could not supply.

The chemistry of normal activity in living cells and organs must be known before the cause of abnormality can be determined. Fundamental data must be secured and applied to a study of man. By knowing the nature of the proteins of the blood and the changes they undergo in infectious diseases and cancer it may be possible to show some common deficiency in liver functions. The old country doctor may have been nearer the truth than he knew when he ascribed most of man's difficulties to disorders of the liver.

Man is a complex organism in which delicately adjusted chemical and physical reactions, play important roles in regulating the physiological processes governing his activities. What is known about these reactions shows them to be highly specific and purposeful. They take place only when needed to promote or regulate some function that is essential to the body. The trouble is that we know too little about the important substances involved in vital processes and the mechanism governing the reactions. Every thought of mine, every word I speak, and every act I perform, call for chemical trigger reactions set to go when needed. If I knew more about these reactions I would be in a position to keep a better guard on myself.

"Who keeps no guard upon himself
is slack,
And rots to nothing at the next great
thaw;
Man is a shop of rules; a well-
trussed pack
Whose every parcel underwrites a
law."

It is not beyond the realm of possibilities to know the laws governing man's activities. More research and better correlation of data will give the desired results. There is no greater need than that for research men and women broadly educated and trained so as to be able to correlate information obtained by many different investigators in different fields of science and focus the results on the solution of biological problems. There are too many lone wolves in chemical and biological research, each interested chiefly in seeing how much he can publish on the little piece of the field he has staked out; no, was staked out for him by the chance circumstances of taking doctorate training under a specialist in that narrow field. The important facts concerning the chemistry of health and disease of man will be ascertained best by chemists who know both chemistry and biology and biologists who also know chemistry; at least, each knowing enough of the related science to appreciate the importance of the approach and the tools to successful results. In the evaluation of the results, philosophy may be of greater help than science. Literature is the best revivifier of scientific endeavor.

The Search for Knowledge

The gateway to a knowledge of the essential facts about the chemistry of man must be, of necessity, the mouse, rat, and other small animals that can be obtained in large numbers and handled in the laboratory. The difficulty comes in fitting the data to man who is usually more, but not infrequently less, well-organized than the rat. It is possible to determine what happens in the rat when certain stresses are applied or when he is subjected to new conditions which call for systematic adjustments. When exposed to an abnormal temperature, for example, his pituitary gets busy immediately producing the hormone needed to direct the adrenal gland to produce more cortical homones to replace those being used up in increased liver and muscle activity. If this increased demand keeps up the glands will enlarge to meet the extraordinary production requirements. But, if cortical hormone is supplied to the rat from external sources, the glands will shut off their extra production and may again go back to normal, unless significant and permanent changes occur. Does anything like this happen to me when I go out in the cold weather? If so, what is the significance?

Two flower moths kissing the petals of a rose invite attention. One has black eyes; the other, red. Why the difference? The black-eyed moth has a black pigment in its eyes and the red-eyed moth no pigment at all. The pigment is formed by enzymatic oxidation of tryptophane, I believe, and the moth without eye pigment lacks the enzyme. Where did this enzyme which alone can convert this product made by both moths into the black pigment for the eye come from and why does one have it and not the other? It seems that the enzyme is laid down in specific elements of the germ cell and the red-eyed moth did not have the right parents to have it. Now, the important point is that if we borrow some enzyme from the black-eyed moth and give it to its red-eyed cousin, this too will have black eyes but only so long as it has the enzyme supplied to it. This suggests the questions: What enzymes, what products are necessary and how do they function in producing the pigments responsible for the color of human hair. What happens when the hair is no longer pigmented and becomes gray? When we know as much about man as is known about the flower moth the chances are good that we will have the answers to these questions and that we may be able to restore the color by furnishing the body what it lacks to produce the pigment and which it can no longer produce for itself.

What is the cycle of events in the growth of cells and what goes wrong to give rise to the cancer cell? What then governs the relations of such new cells with neighbor cells in the same

tissue? Why are they dependent for a time on the tissue of origin and what happens to give them autonomy? If a hormone is involved, how and why does it arise? What part does a virus play in cancer and is this an incomplete or immature cell produced by the tissue as a result of new conditions imposed upon it? What are these conditions? All of these questions and many more must be answered before cancer is understood and a rational therapy developed to cure it or hold it in check. Here too, well-planned research and sustained effort on the part of many capable investigators who can use the tools of both chemistry and biology in attacking the many complex problems are indispensable. Considerable has been found out about cancer in animals and it is fair presumption that the information will be helpful in the study of cancer in man.

We see plants and animals take simple chemical substances and build out of them complex products like proteins, sugars, and fats needed by man for food. Must the chemist accept this as the unchangeable cycle or will he learn to use the tools of construction of the living cell and make the products in factory equipment in any desired quantities in relatively short cycles of time. When it is known how enzymes work to produce proteins, catalysts that work at low temperatures and at atmospheric pressure will be fashioned to enable the chemical manufacturer to produce these proteins as well as others having no counterpart in nature. In the years to come it may develop that for men to get food from vegetable and animal sources will be as rare as his getting colors today from indigo, madder, logwood, woad and molluscs.

"I don't know that I'll ever see,
Come to pass, all these things that mean so much to me.
But if we work hard, by night and by day,
You cannot tell, perhaps, I may."

Baeza Speaks On Employment of Chemists

Walter J. Baeza, F.A.I.C., president of the Industrial Research Company, New York, N. Y., spoke before a meeting of the Queens College Chemistry Society on April 22.

Mr. Baeza, who is in charge of the Middle Atlantic States Regional Employment Clearing House of the American Chemical Society, stated that the Clearing House lists about sixty-five new applicants a month, and places about fifty-seven, despite the fact that seventy-five per cent of the applicants are already employed and merely seeking improvement or change in location. He reported that the prevailing wage scale for graduating chemists is $250 per month, and for recent Ph.D.'s, from $350 to $400 a month.

Crossley as I Know Him

Dr. Henry M. Wriston

President, Brown University

I HAVE known Dr. Crossley ever since he and I were colleagues on the faculty of Wesleyan University from 1914 to 1918. He was in the somewhat exalted position of associate professor while I was an excessively young instructor. Under the tradition which controlled procedure at that time, instructors never spoke in faculty meetings; those who know me best know what a strain that put upon me. But associate professors were free to speak, and those who know Crossley best know that he took full advantage of his position in that respect. He never lacked ideas, nor the power to express them. It was then that I first heard of William Jewell College—where he taught before coming to Wesleyan and to which he referred frequently.

I also became familiar with Dr. Crossley's deep attachment to Brown University with which I had had some pleasant social contact as an undergraduate. Neither of us could foresee that the wheel of circumstance would bring us around to official relations within the institution thirty-two years later, for he is now president of the Associated Alumni of Brown University.

After four years of almost daily association, which a small college such as Wesleyan provides, there was a mere gap of nineteen years when I followed Crossley only through occasional contacts and the reputation he was building as a scientist. During the last decade, however, our new contacts and associations have served primarily to strengthen my original impressions; I find ideas now fully matured which in earlier years had been tentative, though vigorous. What he dreamed as a young man has become the dominant element in his philosophy of life.

Among Dr. Crossley's qualities I should put determination first. Born in the Dutch West Indies, spending a large part of his youth in New York, he was employed at the Builders Iron Foundry in Providence for more than a year before he entered Brown in September, 1904. Prepared at the Evening High School, he came to college with certain conditions, and almost before he was settled his father died. Thereupon he returned to the iron foundry, becoming a metallurgist, and dropped out of the university before the end of the first term, although he did

enough work to receive credit later for a course in chemistry and in German. He was employed as a metallurgist until the end of the next year and returned to Brown in 1906. To support himself while attending college he taught night school in Pawtucket and in day times kept books. He paid his way entirely with small scholarships and his own considerable earnings, working in the chemistry laboratory during the summers to catch up with himself.

He was under the tutelege of Professor John Howard Appleton of the chemistry department, who was the very model of the legendary college professor. His name is enshrined in campus songs and story because he spent fifty years in continuous service of the institution. His relationship to his students was that of a father as much as a mentor. His understanding and inspiring character are woven into the fabric of the Brown tradition. Crossley fell under his influence, and in the human and intimate way which was possible in colleges the size of Brown, the professor took care that conscientious effort and determination should compensate for irregularity in academic procedure.

Having completed his baccalaureate work in three years with honor grades in chemistry, Crossley proceeded immediately to graduate study, and gained election to Sigma Xi before he received his Master's degree. Even though he was an instructor in chemistry, teaching in order to support himself, he drove on with such determination that he completed the requirements for his Ph.D. the following year, in 1911, a great deal of his work being in the field of biology rather than chemistry. I should like to have heard that examination for the Doctor's degree which took one hour and a quarter. The examiners in chemistry were the two professors with whom he had done most of his work and the examiners in biology were conspicuous by their absence. This revealed, on the one hand, an academic informality which is unhappily absent today, and, on the other, a knowledge of the man and a confidence in his power and capacity which were singularly accurate.

Crossley had entered college with the idea of becoming a physician, and it was chiefly because of Professor Appleton's influence that he turned to chemistry. In his first appointment at William Jewell he taught as much biology as chemistry. His later career, in which his research in chemistry were the two profes- largely to the advancement of medical science, stems from this bifurcated interest.

Breadth is the second quality which distinguishes Dr. Crossley. We know him as a chemist; but at Brown he had only six undergraduate year-courses in chemistry, although by in

tensive work he received nine hours credit for a course which normally carried three. This would hardly be regarded today in most institutions as constituting a major or concentration. In biology he took chemical physiology, physical physiology, bacteriology, and general physiology, and hygiene. Physics was studied only one year. He carried very little mathematics and had to acquire that knowledge later the hard way.

In addition to science, he took German, continuing it through the drama of the classical period, reading Lessing, Goethe, Schiller. Then he studied French, which caused him difficulty; doubtless the irregularities of its verbs confused a scientist with an orderly and logical mind. Indeed, on a questionnaire filled out for his class statistician, he listed it as his "least agreeable course." Having passed rhetoric and English composition, he proceeded with public speaking for a year; we are all familiar with the results He regarded rhetoric and composition as his "most valuable course." In history he studied medieval and modern Europe. He had two year-courses in education and one year-course in philosophy—which almost threw him for a loss.

If today one were to offer a student in chemistry a course as broad as that, as little specialized, with less than the bare minimum of mathematics that would be tolerated now and less than the amount of physics that would be considered adequate, he would not be expected to be a medalist of THE AMERICAN INSTITUTE OF CHEMISTS. But I am prepared to say that this breadth proved an asset rather than a liability to Dr. Crossley in the development of his career; it contributed basic ideas upon a wide range of intellectual pursuits which stimulated the imagination and developed a catholic outlook.

My earliest memory of Crossley was in faculty discussions at Wesleyan where, though a scientist, he had ideas as real, as lively, as penetrating, and as insistent in the fields of literature and the arts as in chemistry. The point of view he expressed in those meetings was repeated in the report to this INSTITUTE by its Committee on Professional Education of which he was chairman: "The training for the profession of chemistry must be broad enough to enable the chemist to appreciate the value of cultural subjects, such as art, music, literature, and philosophy; and to safeguard him from the danger of becoming merely a non-social, narrow-minded, individualistic experimenter in chemistry. A training for the profession of chemistry to be adequate must enable a man to serve well in chemistry and at the same time prepare him to be a useful and respected citizen. Service in chemistry often requires highly specialized knowledge. This is best built upon a solid foundation of a properly balanced

composition of scientific and cultural studies."

Throughout the years, Crossley has cultivated that breadth so that in dealing with him as the leader of the alumni at Brown, I have discovered no part of the institution alien to his thought and interest. It is rare indeed to find a chemist of distinction who at the same time is a true exponent and practitioner of the liberal arts. I have never known a scientist to lay more emphasis upon clarity and lucidity of expression, upon precise and accurate form as well as clear and informative substance. This point appeared also in the report of the Committee on Professional Education in which he wrote: "It is highly important that the training in English should enable a person to appreciate the necessity of making proper and accurate records of his observations. This training could best be given in the scientific department in connection with the taking of lecture notes and the recording of the phenomena observed in laboratory experiments. The chemist should be taught to appreciate the necessity for recording his observations promptly and accurately. He should also be trained to report the results of his work in such a way as to call attention to their importance."

The third quality which I associate with Dr. Crossley is inflexibility of standards. The politician by the nature of his occupation must be a wise compromiser, but the scientist by the very definition of his function should be a poor compromiser, and in that respect, Crossley is a flawless scientist. He can see the shades between white and black; he can understand the dilemmas and doubts when one is forced to make decisions; but between right and wrong there is to him a fixed line and not a mere blur or a hazy relativity. On his student questionnaire, as a "pointer to Freshman," he wrote: "Be yourselves. Don't give up your personalities to be called by some 'good fellows'." As a teacher, without losing his humanity, he held his students to rigorous standards. He had had to work terribly hard; work was his habit and his joy; he had no patience at all with laziness and has never acquired any. He considered science a precise discipline; he applied the same standards of precision in judging academic work.

Without determination, Crossley never could have survived the disappointments which any profound investigation involves; without breadth he never could have seen scientific problems in right perspective; without inflexibility of standards he never would have achieved results of a quality to gain him the distinction which you recognize tonight.

But without the fourth attribute to which I must refer, he never would have seen the problem at all. That fourth quality is imagination. It is a

word not very well understood today. Everything is laid before us in explicit detail—the radio serves the news hot every hour on the hour like an old-fashioned trolley schedule; the movies make each thing explicit; stage settings leave as little as possible to the imagination; literature in its urge toward realism describes the garbage can and its odoriferous contents as explicitly as possible. There is slight stimulation to the imaginative disciplines, by which one learns to turn fancy into fact and to make his dreams become the pattern of his labors.

I do not know the source of the rich and full and varied imagination which has been such an important characteristic of Crossley. It found an outlet in his first year at Brown, when his eagerness for the enlightenment that comes from the mutual mitigation of ignorance through discussion led him to organize a society primarily for debating, composed of students of unusually scholarly tastes. This group fell into the pattern of the social life of the campus and became a secret society and ultimately affiliated with one of the national fraternities. That was characteristic of Crossley—discovering some gap in the structure of life about him and by imaginative projection and the application of energy filling the lacuna. He was one of the moving spirits, not many years later, in organizing the young faculty group of Wesleyan where those who could not greatly influence college policy because of their youth, could enlighten themselves upon the educational issues and exercise a leverage out of proportion to their academic seniority.

My experience in administrative work has led me to conclude that richness of imagination is the only way by which men can identify problems that are worth investigation. It is illuminating to note that, when a Senior, Crossley described the "most valuable thing" obtained from his college course as the "power to see problems and to solve them." Industrial research is held up not nearly so much because firms are unwilling to spend the money as because they do not have the imagination to know what their real and fundamental problems are. It is fashionable now to follow a trend. If one institution develops a novel project, it is immediately copied; so it is in business also. But the person who sets the trend, who initiates the program which becomes the trend, must have rare insight of an imaginative kind. I suspect that in the work of greatest distinction which led to this honor tonight, the capacity for seeing in the mirror of the mind what other people could not observe was of first importance.

There is another quality of a personal kind which I believe explains Crossley's success. It is not enough to have imagination; that may just

mark a man as separate from his fellows, as peculiar and odd. Imagination can lead a man to be extremely lonely because he sees things that others do not. But the man with the quality of infectious enthusiasm can expound to others what he sees. He can make them see what they themselves would never have discerned and at the same time he can give them a sense of partnership in the project. His enthusiasm stimulates their insights and evokes in them like determination, and like vigor in investigation.

Dr. Crossley possesses the warmly human aspect of personality which makes it possible for a leader to acquire followers and make those followers not minions but comrades, thereby creating an effective research team. Thus by planting seeds, and helping them to grow through cultivation and fertilization, a single individual expands his power, multiplies his insights, and makes a contribution to the world far beyond that possible to his own unaided talents and energies, however great they may be. The sense of comradeship of an intellectual kind is more difficult to achieve and to make effective than the comradeship of the Pullman car smoker or the social club. It is easier to be a hail-fellow-well-met than to be a respected stimulator of colleagues who would otherwise be only subordinates.

Looking back over thirty-three years, I see a very young man who had already overcome obstacles which required determination, breadth, inflexibility of standards, imagination, and infectious enthusiasm. I will not pretend that those who knew him in undergraduate days or in his earliest professional years could foresee how those qualities would lead him. But those who have followed his career so long can now understand and explain it. Better than that, they can rejoice in the fulfillment of youthful promise.

The late Willa Cather in one of her least known books, "Not Under Forty," wrote: "The world is always full of brilliant youth which fades into grey and embittered old age." That is equally applicable to literature, teaching, research, and every aspect of the world's work. When, therefore, one finds in maturity even more than could have been anticipated in youth, it is a triumph of character from which the world draws rich dividends: And some "fell into good ground, and brought forth fruit, some an hundredfold."

The Federation of Paint and Varnish Production Clubs, founded in Cleveland in 1922, will celebrate its 25th anniversary at the first business meeting of the Clubs' newly formed council, to be held in the Cleveland Hotel, Cleveland, Ohio, on June 14.

The Scientific Achievements of Dr. Crossley

Dr. Arthur J. Hill, F.A.I.C.

Director, Sterling Chemistry Laboratory, Yale University

FOR many years, I have had many opportunities to appraise, and then genuinely to admire, the quality and quantity of Dr. Crossley's thinking.

My first experience with his research contributions was in the Spring of 1917. I was interested in the sulfonation of nitrobenzene, and had observed in the J.A.C.S. **39** 117, 1917, an article entitled "Researches on the Action of Sulfuric Acid on Certain Nitrocarboxylic Compounds. I. The Action on Nitrobenzene." (By M. L. Crossley and C. B. Ogilvie.)

In this article he described a peculiar reaction, of considerable violence, which occurred at 195°, "in the action of concentrated sulfuric acid on nitrobenzene." Indeed he stated: "In spite of all precautions the reaction increased in vigor and was controlled only with great difficulty." For reasons, which need not be stated, I doubted the observation. I performed the experiment myself in the old Sheffield Chemical Laboratory, the ceilings in the basement of which, where my laboratory was located, were low. For many months after my experiment the ceiling over my laboratory desk bore mute testimony to the *accuracy* of our medalist's observations, to say nothing of the tardiness of the redecoration program of the older Sheffield Scientific School.

Dr. Crossley's educational career appears to have been carefully planned. Not only did he pursue the course of training at Brown University which led to the Ph.D. in chemistry, but he was also able, by dint of his characteristic zeal and determination, to acquire a substantial training in pre-medical and medical subjects—a course of action which has had profound influence in shaping his scientific career. I have it on good authority that the "library habit," so important to a scientist, was early a part of the pattern of his education. And all his friends can testify to the fact that he has never ceased to be an avid reader.

It seems quite clear, therefore, that his educational background led to his interest in medicinals on the one hand, and in dyes and intermediates on the other.

Dr. Crossley's interest in the application of chemistry to medicine did not find reflection in his earliest publications. These were concerned chiefly with the study of dyes, or dye intermediates, and dealt specifically with the fundamental chemistry of anthraquinones and with the properties of hydroxyanthraquinone dyes. And though these investigations were seemingly remote from medicinal chemistry, it is true that the fundamental chemistry involving syntheses of dye intermediates is often very definitely the chemistry which is commonly invoked in the synthesis of medicinals.

As a university teacher I should like to pay earnest tribute to the fundamental chemical importance of his fine work on dye intermediates, color in relation to chemical constitution, the chemistry of diazotization and coupling, azo dyes and metallized dyes.

Dr. Crossley's many friends will welcome the day when he has opportunity to assemble and to develop in book form, the extraordinary amount of information he possesses on the subject of azo dyes.

Dr. Crossley's profound interest in medicinals began to be shown in his publications even as early as 1919. For example a paper in the J.A.C.S. **41** 2083, "Gentian Violet. Its Selective Bactericidal Action," contained significant chemistry on the triphenyl methane dyes together with observations on their bactericidal properties and the mechanisms of their physiological action.

His valuable contributions to the chemistry of cincophen and related compounds appeared shortly after.

Of the most extraordinary importance were his papers on the sulfa drugs, which first appeared in 1938, and which have brought to Dr. Crossley and his associates warmest praise, both because of the scholarly qualities of these papers, and because of their great humanitarian value.

Notwithstanding the importance of these papers concerned with the synthesis of medicinals, one cannot help being impressed by a philosophical viewpoint of Dr. Crossley's which in its broader significance may open new vistas in the chemistry of medicinals.

There has come to this field a comparatively new and far reaching basis for the synthesis of new agents for the cure of disease. It is literally frightening in its implications for the present-day chemist. Apart from being a good chemist, the investigator could with advantage be also a physiologist, an enzymologist, a pharmacologist, etc. In brief, the classical idea of extensive synthesis of closely related compounds followed by routine pharmacological testing has given way to a primary consideration of the mechanism of the bodily processes in health and disease, and of the integration of these facts with the synthesis

of appropriately-constituted medicaments.

Dr. Crossley, with his broad knowledge of biological processes, has been a pioneer in this newer philosophy. It courses through his publications bearing on chemotherapy; it finds expression in papers on polarographic and other studies of blood serums, and in his important work on synergism. And it is indeed refreshing and stimulating to hear these matters discussed by Dr. Crossley in conferences, and in his public addresses.

Dr. Crossley also has long been interested in the education of the chemist. He has often said in this connection that there are three qualities essential to success. The first two are knowledge and imagination, both of which are so clearly evident in his own career. The third attribute is character, and this our medalist possesses in the highest degree.

Dr. Crossley In Industry

S. C. Moody

Vice-President, American Cyanamid Co., General Manager, Calco Chemical Division

ALTHOUGH I joined the Calco Company a year or so after Dr. Crossley did I have spent the intervening years selling many of the products for which he was responsible.

The dystuff industry in those days was a struggling infant in the most literal meaning of the phrase. The Calco Chemical Company had started a few operations in the latter part of 1915, and by the end of the First World War had succeeded in attaining some measure of stability, after a long series of false starts, many mistakes, much blustering, and a tremendous amount of hard work! Of course, the chief difficulty was that there was scarcely more than a mere handful of people in the country who had had any training to speak of in the synthesis of intermediates and dyes. Dr. Crossley belonged to this select group, having been head of the Department of Chemistry of Wesleyan University for four years. It was indeed fortunate for Calco that he was induced to join the organization in 1918 as our chief chemist.

As teacher and educator, he had acquired a broad knowledge of science and the liberal arts. He had already established a reputation in organic and physiological chemistry, as illustrated by his published scientific papers. This was the background and training which he brought with him,

and which he was determined to apply to the development of an American coal tar dye industry.

During the first few years of the Company, it was intended that Calco should limit its efforts to the manufacture, on a large scale, of a few of the important intermediates, such as nitrobenzene, aniline oil, dimethylaniline, beta naphthol, and a few others. As time went on, it became evident that this left us in a very vulnerable position, and that for our own protection, we would have to expand into the manufacture of many of the principal dyestuffs that were derived from our own intermediates. The success we have attained can not be attributed to any one individual, but as chief chemist, and later as director of research, Dr. Crossley has played a very vital part, not only in the development of basically sound processes, but even more particularly, or "more importantly", in the planning of a program for the utilization of our basic materials to the greatest possible degree.

In addition to his technical background, Dr. Crossley has a well-developed New England appreciation of the value of profits to a successful manufacturing program, and I can say from my own experiences with him over the years that he has trained his men to think in terms of eventual production of profitable items.

Like any successful scientist, Dr. Crossley has a large and well-developed bump of curiosity, and because of this, we in the sales department were slightly annoyed during a considerable period at what we thought was a lack of progress on the part of our Research Department. We watched the payroll mount as first a physical chemical section was set up, and then later, a physics department, when we thought that our business really needed more organic chemists. It was not until some years later that we learned that what Dr. Crossley was doing was right, after all. He was trying to find out what takes place when dyes are applied to different animal, vegetable, and synthetic fabrics, so that he and his men could bring about improvements, modifications, and new products to accomplish the desired results. We even have a motion picture in color, taken through a microscope, showing how a dye is absorbed from solution by a single fibre of wool. We have hundreds upon hundreds of slides, showing cross-sections of dyed fibres of all kind. These have been made during the course of exhaustive studies to determine rates of dyeing of different fibres, degree of absorption of various dyes, and to determine at least some of the reasons for non-uniformity in certain dyeing operations. The results of these fundamental studies are new and improved vat and azo dyes, metallized azo dyes, easily dispersible dyes and pigments, and in some cases,

even new methods of application of color.

During World War II, Dr. Crossley and his associates were called upon continually by practically every branch of the armed services to contribute, advise, and take a leading part in the solution of a variety of problems involving color. Basic data on camouflage, proper dyes for colored signals, colored smoke screens, dyes for military equipment and uniforms were some of the problems they were called upon to solve. Dr. Crossley was chosen by the Quartermaster's Corps to become a member of a technical team which this Corps sent to Germany at the conclusion of the European phase to investigate the military uses of dyes and textile auxiliaries. The technical reports of this group have been commended for their thoroughness and exactness.

Back in the Fall of 1936, Dr. Crossley read an article in the British journal, *Lancet,* confirming the activity of sulfanilamide against the hemolytic streptococcus. He was very much impressed by this paper, because he knew this had previously been reported by Trefouel and his associates at the Pasteur Institute. He recognized that this obviously had great possibilities, and that its development fitted logically into the Calco development picture. He promptly gathered together a research team which brought out in rapid succession sulfanilamide, then sulfapyridine, sulfathiazole, sulfaguanidine, sulfadizine, and more recently, sulfamerazine and sulfamethazine. These were all logical for Calco, because they are derived from aniline oil, and the manufacturing techniques are closely related to the manufacture of many of our other products. The splendid war record of the sulfa drugs is known to everyone, and their continuing importance in human treatment is equally well-known. What may be news is the ever widening consumption in the veterinary field, and the volume has already attained very impressive totals.

It has been said by some cynic that the chief difference between a research department and the stars of the Metropolitan Opera Company is in their ability to sing. This is not true in Dr. Crossley's case. His extremely diverse interests have given him a rare poise and an immense amount of tact, and a wealth of plain, old-fashioned common sense. It has been a rare pleasure and a great privilege to have been associated as intimately as I have been with Dr. Crossley in Industry!

The July issue of THE CHEMIST will contain the three papers on professional status given at the annual meeting of the A.I.C., and a panel discussion on fields, other than chemistry, where a chemical education is useful.

New Councilors Elected

The following new councilors-at-large were elected at the annual meeting of THE AMERICAN INSTITUTE OF CHEMISTS, held on May 2, 1947. They will serve for three year terms ending May 1, 1950.

DR. LINCOLN T. WORK

Dr. Work is director of research and development for the Metal and Thermit Corporation, Rahway, New Jersey.

He received the Ph.D. degree from Columbia University in 1929, and became instructor and associate professor there before joining the Metal and Thermit Corporation.

In 1932, he was elected to Fellow membership in THE AMERICAN INSTITUTE OF CHEMISTS. Dr Work has always taken an active part in the activities of the professional societies. He has served as chairman of various committees and as councilor of The American Chemical Society. He has been chairman of the New York Section of the American Institute of Chemical Engineers; chairman of the American Section of the Society of Chemical Industry, and chairman of the Electrochemical Society. He is an advisory member of the Technical Committee of the New York Paint and Varnish Production Club. He has been national secretary-treasurer and national president of Phi Lambda Upsilon, and he is an honorary member of Theta Tau.

MR. LAWRENCE H. FLETT

Mr. Flett is director of the New Products Division, National Aniline Division, Allied Chemical and Dye

Corporation, New York, N. Y.

He received the B.S. degree from Massachusetts Institute of Technology in 1918, and started as research chemist with National Aniline and Chemical Company, followed by two years with the Atlantic Dyestuff Company. In 1922, he became research chemist for National Aniline Division of Allied Chemical and Dye Corporation at Buffalo, from which he was transferred, in 1944, to his present position. He was awarded the Schoellkopf medal in 1942 in recognition of his ability in industrial research.

Mr. Flett became a Fellow of THE AMERICAN INSTITUTE OF CHEMISTS in 1943, and has taken an active part in its work. He has served as chairman of the Niagara Chapter; as co-chairman of the National Committee on Membership; as chairman of the Program Committee of the New York Chapter, and as New York Chapter representative to the National Council.

Dr. E. H. Northey

Dr. Northey is administrative director of the Stamford Research Laboratories of the American Cyanamid Company at Stamford, Connecticut. He received the Ph.D. degree from the University of Minnesota in 1930, and then became research chemist in dyes and explosives for E. I. du Pont de Nemours and Company. In 1932, he joined the Calco Chemical Company as research chemist in dyes and pharmaceuticals, later becoming divisional chemist, and then assistant director of research. Calco became a division of the American Cyanamid Company in 1941, and four years later, Dr. Northey was appointed to his present position.

DR. E. H. NORTHEY

Dr. Northey was elected to Associate membership in THE AMERICAN INSTITUTE OF CHEMISTS in 1932, and was raised to Fellow membership in 1940. He has served actively both in the New York Chapter of the INSTITUTE and on its national committees. He was chairman of the Committee on Employer - Employee Relationships which issued the notable report, "The Employed Chemist and his Employer."

What the A.I.C. Is and Does

Annual Report of the President

1946-1947

IT seems pertinent to review at this time what THE AMERICAN INSTITUTE OF CHEMISTS is as a preliminary to what it does.

The INSTITUTE is a professional society, and in common with other strictly professional organizations, it has certain attributes. It is national in scope. Its membership is composed of individuals who meet specific qualifications of education and experience. It is administered by elected officers and councilors who take time from the practice of their profession to determine policies and a program. The primary objective of policies and program is to raise the status of the profession.

The officers, councilors, and chapter representatives of the INSTITUTE constitute its governing body or Council. This Council determines the official action to be taken on matters presented to it. The subjects presented for action are suggested to the Council in various way: (a) Any individual member of the INSTITUTE may direct a suggestion to the Council; (b) The Chapter representative may present a subject of interest to his Chapter; (c) Any officer, councilor, or Chapter representative may present a subject; (d) Letters may be directed to the Secretary by members or non-members suggesting matters to be called to the attention of the Council.

All matters presented to the Council are carefully considered and discussed. Depending upon their subject matter, they may be (1) referred to a standing committee for consideration and report back to the Council for action; (2) referred to a special committee appointed by the Council for that purpose; (3) acted upon directly by the Council, or (4) referred to the membership for individual vote.

After suitable action has been determined by the Council, the Secretary or other designated official is authorized to prepare and deliver the necessary papers.

The INSTITUTE is an incorporated body. By law a board of directors must take legal responsibility for acts of corporations. The Board of Directors thus adopts, at the end of each fiscal year, a resolution to approve all of the acts of the National Council during the year. The Board of Directors does not determine the policies of the INSTITUTE. It is merely legally responsible for those actions taken by the Council.

The INSTITUTE welcomes the opinions expressed by its individual members. Careful consideration is given to each communication. The Councilors and Officers, who represent, and are elected by, the members, hold diverse opinions on many subjects. When controversial subjects are considered for action by the Council, varied points of view are weighed carefully. Only when all sides of a given subject have been heard, does the Council take action. Your INSTITUTE is governed by the wishes of the members. The Council reflects your desires. Cooperate with your representatives. Let them know your wishes.

The current year opened with a proposal for coalition of the American Chemical Society and the INSTITUTE. The plan appeared workable and in the best interests of both organizations. Acting against the recommendation of its own committee, it was turned down by the ACS Council at Atlantic City.

The Council's attention was directed by a member of the INSTITUTE to Delaware Senate Bill No. 75, which, in essence, attempted to limit the supervision of the manufacture of drugs, medicines, toilet preparations, dentifrices, or cosmetics, in the State of Delaware, solely to registered pharmacists, thus excluding qualified chemists—a direct restriction and reflection on the profession of chemist. The Council acted unanimously to protest against this Bill, which was stricken from the Delaware Senate calendar.

The Municipal Chemists of the City of New York have received further support of their petition for salary and grade readjustments. The Council cooperated with this group and sent its recommendations to the Board of Estimate and other officials of the City of New York. It has recently been reported by these chemists that so far no official action has been taken by the city. A special committee of the Council is now meeting with these chemists to determine what action is still necessary.

National legislation has again been introduced into the House and the Senate to create a National Science Foundation. Similar bills were before the legislatures last summer, but Congress adjourned before final action was taken. A bill has been introduced into Congress to repeal the Atomic Energy Act of 1946. The Council is studying the current proposed legislation for report later.

The Committee on Employer-Employee Relationships made available to chemists and employers a study on "Termination of Employment" (August, 1946, CHEMIST), which has been widely requested by employers of chemists.

The INSTITUTE maintains a policy of service to individual members and many inquiries were received during the year. Such professional subjects

as conditions of employment, contracts, methods of personal improvement, ethics, etc., were inquired about. Several score of letters were received from returning veterans concerning opportunities for them in chemistry, what subjects to study in college, etc. Chemical firms requested information on contracts, salaries, and educational standards. In some cases, these inquiries were referred to specific persons or sources of information. In others, data concerning the inquiry was provided from the reports of our various committees.

The National Society for Medical Research asked the INSTITUTE'S cooperation in its efforts to make the facts about the value of animal research, when done by qualified scientists, available to the public. This matter was referred to a special committee, and its favorable recommendations were adopted by the Council at its March meeting.

The Committees and Council of the INSTITUTE have kept in touch with activities affecting the profession of chemist, whether national or local, and information about these developments has been published from time to time in the INSTITUTE'S journal. It is not important that each member agree that what has occurred affects the profession, but it is important that every member know what is going on which could affect the profession. An informed membership is essential, if suitable action is to be taken by the elected representatives of the membership.

The INSTITUTE has continued to process applications with great care as in the past. What is more important, it polices the standards maintained by its membership. During the past year two cases before the committee on ethics were terminated by allowing the person to resign or equivalent. That is, I think, a sign of good health. We can't be one hundred per cent accurate in admissions, no body of humans can, but we can correct our errors.

The INSTITUTE honors itself this year by honoring Dr. Moses Leverock Crossley, twice past-president, by the award of its Gold Medal.

The INSTITUTE believes in mathematical formulas and has set for itself "more members=more budget=more accomplishment." The INSTITUTE has in the past made little effort to interest members and associates, as distinguished from fellows. We should double and even treble our membership within a year. Concrete plans are laid for a program which is designed not to be limited to bringing in fellows.

—FOSTER DEE SNELL
President

The American Petroleum Institute, 670 Fifth Avenue, New York 19, N. Y. is engaging in an extensive campaign to inform the public concerning the petroleum industry. Its slogan: "Petroleum Promotes Progress."

Annual Report of the Secretary

1946-1947

The national Council held nine meetings during the year, with an average attendance of eleven officers and councilors. The following actions upon membership were taken:

Elections

Fellows	62
Members	19
Associates	20
Total	101

Reinstatements

Fellows	5
Associate	1
Total	6

Loss of Membership

Resignations

Fellows	46
Members	7
Associates	13
Total	66

Dropped

Fellows	24
Members	4
Associates	9
Total	37

Deceased

Honorary	2
Fellows	20
Total	22
Total Loss of Membership	125
Total Increase of Membership	107

Actions

Fellows to Life Members	2
Members to Fellows	11
Associates to Members	4

TOTAL MEMBERSHIP AS OF MAY, 1947

Fellows	1568
Members	193
Associates	205
Life Members	30
Honorary	6
Total	2002

It is with regret that we record the following deaths during the year:

W. L. Blackhall
H. D. Boddington
A. W. Burwell
W. C. Dumas
Henry Fisher
H. H. Fries
H. B. Glass
Moses Gomberg
P. A. Greco
J. A. Hammond
H. M. Harff
W. G. Karr
E. F. Kern

J. W. LAWRIE
R. J. MOORE
L. V. REDMAN
WHITMAN RICE
MARY A. ROLLAND
G. A. SEIL
MAXIMILIAN TOCH
H. C. WINTER
C. A. UTT

Because of the proposed coalition, some of the Committees, including the Committee on Membership, withheld activities somewhat, awaiting the decision concerning the coalition. That the INSTITUTE shows a net loss of only 24 members (despite a death list of 22) is excellent testimony to the interest of our members in their professional society.

During the summer of 1946, a new membership directory was completed, which contained a brief biographical sketch of each member. It was issued with data correct as of September 1, 1946.

During the year, there was an average of over fifty changes of address each month, necessitating the preparation of over four-hundred cards per month, or eight cards per change of address to cover mailing bureau records, Chapter records, and office records.

Many inquiries concerning professional matters were received and answered. A great number were from young chemists and returning veterans, and several score were from young women who were interested in becoming chemists.

Many other matters of routine nature, it will be understood, were necessarily carried out by the Secretary's office.

The National Council contributed to each Chapter $50.00, in addition to the regular Chapter dues-refunds, to encourage additional Chapter activity.

The Committee on Ethics investigated two cases which were referred to it, and its reports were accepted and acted upon by the Council.

The President of the INSTITUTE made frequent trips to speak before various Chapters concerning professional matters. At the recent Council meeting, Dr. Donald B. Keyes was appointed chairman of a Committee to prepare a list of speakers who might be called upon to address Chapter meetings.

Other activities of the INSTITUTE are covered in detail in the reports from the president, chapters, and committees, presented at this annual meeting.

It is desired to express appreciation to the chairmen and officers of the various chapters, to the chairmen and members of the committees of the INSTITUTE, and to all those who have given generously of their time to advance the work of the INSTITUTE. Many of the INSTITUTE'S accomplishments are accredited to their efforts.

—LLOYD VAN DOREN,
Secretary

Laboratory Clinics At Brooklyn Polytechnic

Dr. Raymond E. Kirk, F.A.I.C., announces that four summer laboratory clinics will be held at Polytechnic Institute of Brooklyn, New York. The first will be on the "Weight and Shape of Polymer Molecules in Solution", June 23rd to 27th, "Industrial Applications of X-ray Diffraction" will be given July 7th to 18th; "Advanced X-ray diffraction, July 21st to 26th, and "Polymerization Techniques", September 8th to 12th. Inquiries should be directed to Prof. H. Mark, or Prof. I. Fankucken, at Polytechnic.

Potash and Chemical Corporation's Research Intensified

The Potash and Chemical Corporation reports that its research program is being intensified to diversify its products, particularly through the manufacture of derivatives of the chemical constituents of the Searles Lake brine. The $310,000 addition to the research and engineering laboratory, on which construction was started during 1946, is nearing completion.

Dr. George R. Harrison, dean of the School of Science, Massachusetts Institute of Technology, has been elected chairman of the American Institute of Physics, to succeed Dr. Paul E. Klopsteg.

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CHEMICALS
ESSENTIAL
OILS
AND
COMPOUNDS

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Necrology

Mary Augusta Rolland

Mary A. Rolland, research chemist and market analyst, died April 10, at the New York Hospital, after being ill for over a year.

Miss Rolland was born at Ithaca, N. Y., June 3, 1904, while her father, Alfred A. Rolland, was teaching chemistry at Cornell. He died the following year, and although she often expressed regret that she never knew her father, she felt grateful that he had "put chemistry into her blood." A brilliant student all through school, she was graduated from the College of St. Elizabeth, in New Jersey, in 1922, with the B.S. in chemistry.

Her career was an interesting answer to the question, "Where were the women chemists between the wars?" During summers in college and for two years after graduation, Miss Rolland worked in biological laboratories, and then took the Master's degree in chemistry and bacteriology at Columbia University in 1925. After study at the Postgraduate Medical School and Teachers' College, she taught science in Hunter College High School and Newtown High School, but she soon returned to laboratory work, specializing in research on the bacteriology of house dusts. When a severe infection drove her from that position, she spent two years as secretary of the Membership Committee of The Chemists' Club, New York.

Yearning for laboratory work again, she went, in 1930, to Reed and Carnick, Jersey City, N. J., where for five years she did pharmaceutical research, specializing in hormones, studies of toxicity, and the morphology of tumors, from which she went to the Crocker Institute, New York, for special work on cancer. In changes caused by the depression, she taught biochemistry at the Women's Medical College, Philadelphia, and was reference librarian in science and technology at the Queensborough Public Library, Long Island City, N. Y. She then became production manager of the Ampul Department of the Maltbie Chemical Company, Newark, N. J., where, after designing the laboratories, she had full charge of research on new products, packaging, marketing, etc. After an accident terminated this promising work, she went, after a long period of recovery, to Washington, where, in the lack of more congenial chemical work, she was a buyer in a department store during the day, and laboratory technician for physicians in the evenings.

During the war, Miss Rolland was an industrial specialist with the

Chemicals Bureau of the War Production Board, handling priorities and allocations on all chemicals related to coal tar, aromatics, plasticizers, glycols, and intermediates. In 1944, she returned to New York and for a year was market analyst for the Aromatics Division of General Drug Company. Her last position was on the editorial staff of Interscience Publishing Company, New York.

Miss Rolland became a Fellow of THE AMERICAN INSTITUTE OF CHEMISTS in 1931, and she was always interested in its activities. She was a member of the American Chemical Society and the Women's University Club of New York. Everyone will remember "Pete" as a brilliant and dynamic woman, whose keen wit and mental resilience made her the best possible sport in the face of all adversity. Brave in the last attack of her illness, she was cheerfully awaiting treatment with the latest announced remedy for the dread disease of which she knew so much, ". . . Not that it will do me much good, but they might learn something on me that will help a lot of others."

—F. E. W.

Thomas S. McCarthy

Thomas S. McCarthy, managing editor of the *Oil, Paint, and Drug Reporter*, and managing editor of THE CHEMIST, died, May 9, in St. Mary's hospital, Brooklyn, N. Y., at the age of forty-two.

He was born in Philadelphia and educated at Villanova College and the Wharton School of the University of Pennsylvania. In 1918, he became a reporter for the International News Service; in 1919, for the *Philadelphia Record;* in 1921, the *Philadelphia Evening Bulletin,* and from 1926 to 1930, the New York News Bureau. He then joined the *Oil, Paint, and Drug Reporter* as reporter, becoming associate editor, and managing editor.

Thoroughly familiar with the chemical industry, Mac was widely appreciated there by his many friends for his generosity and his sociable nature. Without recompense of any kind, Mac made his technical and business knowledge freely available to THE CHEMIST by serving in an advisory capacity as "managing editor" from September, 1943, until his death. During the dark days of war shortages and production difficulties, Mac's ingenuity and assistance solved many problems. No one could work around or with him and not be cheerful, such was the impact of his own optimistic personality. Though still suffering from an operation which he endured last year, this did not diminish his enthusiasm, and less than a week before his death, he was active in his work.

He was a member of The Chemist's Club, and of the Salesmen's Association of the Chemical Industry.

For several years, he edited the latter society's annual humorous publication, "The Chemical Peddler".

He is survived by his widow, the former Anne M. Hediger, and by his two young sons, Thomas, Jr., and Joseph.

UNESCO Aids Chemical Union

Director General Dr. Julian S. Huxley has informed the International Union of Chemistry that UNESCO has provisionally allocated the sum of $26,448 to the Union for 1947, approximately $20,000 of which is immediately available as a contribution toward meeting the traveling expenses of members of the International Commissions planning to attend the XVIth Conference of the Union in London, July 17-23rd, immediately following the Centenary Celebrations of the Chemical Society of London, and in association with the XIth International Congress of Pure and Applied Chemistry.

These twenty-one Commissions of the Union deal with questions of international importance relating to standardization, nomenclature, measurements, atomic weights, tables of constants, encyclopedic chemical compendia, codification, etc., and their reports are published in one to five languages.

The Chemical Society celebrations will be under the presidency of Professor C. N. Hinshelwood, while the President of the Congress will be the Right Honorable the Viscount Leverhulme. The Conference of the Union will be under the presidency of Colonel Marston Taylor Bogert, F.A.I.C., professor emeritus of organic chemistry, Columbia University, who has held this position since his election at Rome in 1938.

The International Union is a federation of twenty-five to thirty countries, which was founded in 1919 and has been rebuilt since the close of World War II. This will be its first conference since 1938. Its senior vice president is Sir Robert Robinson, who recently received the Gold Medal of the Franklin Institute. Another of its eight vice presidents is Dr. Alexander Nesmeyanov, director of the Research Institute of Organic Chemistry, National Academy of Sciences, Moscow, U.S.S.R.

This gift from UNESCO recalls the fact that recently the American Chemical Society set aside a fund of $25,000 to be used to pay the expenses in this country of foreign chemists and chemical engineers who wished to engage in advanced study and who cannot make the trip without such aid. Candidates for this support are to be designated by UNESCO.

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JAMES R. WITHROW, *At-Large*

April Meeting

The 236th meeting of the National Council was held April 21, 1947, at 6:00 P.M. at No. 2 Park Avenue, New York, N. Y. The following officers and councilors were present: Messrs. S. R. Brinkley, L. V. Clark, H. L. Fisher, L. H. Flett, F. A. Hessel, F. C. Huber, D. B. Keyes, R. E. Kirk, J. Mattiello, H. S. Neiman, D. Price, F. D. Snell, and L. Van Doren. A. J. Nydick and V. F. Kimball were present.

The minutes of the previous meeting were accepted.

A letter from Joseph F. Padlon, F. A. I. C., concerning HR-2520, known as the Michener Bill, recently

introduced in the House of Representatives, was read. Upon motion, Mr. Padlon was asked to prepare a statement concerning this bill for THE CHEMIST, to be prefaced with the comment that the INSTITUTE would like to call this bill to the attention of the membership.

Mr. A. J. Nydick, F.A.I.C., called attention to a case involving an accountant, which was decided recently by the Supreme Court of the State of New York. The accountant was accused of practicing law without the legal right to do so, though he had only given advice in connection with the filling out of income tax forms. The Supreme Court held that he was practicing his own profession and not that of law when he advised his clients concerning the regulations governing the filling out of income tax forms. The case is now being appealed to the Appellate Division. Mr. Nydick asked that the INSTITUTE prepare a brief, to be presented, *amicus curae,* to the Appellate Division, directed to the premise that when a professional man's advice includes the legal phases applicable to a given situation, this does not constitute the practice of law. If the Appellate Division upholds the Supreme Court and such a statement concerning the professions appears in the decision, this will do much to insure that the professional chemist will be able to practice without possible accusation of legal infringement, when it is necessary for him to take into consideration and to advise relative to the pertinent legal regulations.

Upon motion, Dr. Donald Price was appointed chairman of a committee to make recommendations to the Council concerning the proper action to be taken. The other members of the committee are Dr. Donald B. Keyes and Mr. A. J. Nydick. The chairman of the committee was given authority to appoint an even number of additional members, if he so desired.

A vote of thanks was given to Mr. Nydick for the time and interest which he has given to this subject.

Mr. L. H. Flett, chairman of the Committee to Contact the Chemists of the city of New York, reported and recommended:

1. That the situation of the city chemists be called to the attention of the highest officials of the city.

2. That the facts concerning the low professional status of the city chemists be again published in THE CHEMIST, and

3. That if further action is not forthcoming from the city officials, the matter be released for general information.

The matter of publishing semi-scientific articles in THE CHEMIST, in addition to professional material, was discussed. It was stated that chemists prefer some scientific material in addition to professional articles in the journal. It was suggested that pic-

tures of chemists be used on the front cover of THE CHEMIST, and that those of the chapter chairmen would be of wide-spread interest, and serve to unite the Chapters more closely with the national organization.

Upon motion, Dr. Donald B. Keyes was appointed chairman of a committee which would serve as a speakers' bureau to recommend available speakers to the various chapters.

The following new members were elected:

Fellows

Agruss, Meyer S.
Consultant, 600 South Michigan Avenue, Chicago, Illinois.

Joffe, Joseph
Professor, Chemical Engineering, Newark College of Engineering, 367 High Street, Newark, N. J.

Associate

Olmon, Lawrence B. D.
Research chemist, Oakite Products Company, Inc., 22 Thames Street, New York 6, N. Y.

Raised to Fellow

Albright, Paul F.
Control Chemist, Bowman Gum, Inc., 4865 Stenton Avenue, Philadelphia 44, Penna.

Servis, Richard J.
Chemical Engineer, Winthrop-Chemical Company, Rensselaer, New York.

There being no further business, adjournment was taken.

Chapters

Chicago Chapter

Chairman, Edward L. Gordy

Vice Chairman, J. Bowman

Secretary-Treasurer:
Mary L. Alexander
Universal Oil Products Co.
310 South Michigan Avenue
Chicago 4, Illinois

Council Representative,
Martin De Simo

Reporter to THE CHEMIST,
Madge M. Spiegler

The Chicago Chapter held its annual business meeting on May 16th at the Electric Club. After a group of interesting committee reports, the officers shown above were elected to serve for next year, and the following councilors were elected to serve three-year terms: F. M. Beegle, W. J. Podbielniak, and M. J. Hiler.

Dr. Foster D. Snell, national president and speaker of the evening, preceded his talk on "Chemistry a Profession" by commenting briefly on the activities of the Chicago Chapter and summarized the aims and changes in the national organization. After Dr. Snell's talk, the meeting was thrown open for questions, comments, and discussion from the floor.

Annual Reports 1946-'47

LOUISIANA

Annual Report 1946-47

The Louisiana Chapter has had only two meetings so far this year. The first was a dinner meeting, held on December 4th, 1946. Officers were elected and a discussion on "THE AMERICAN INSTITUTE OF CHEMISTS' Role in the Future Professional and Economic Status of the Chemist" was conducted.

The second meeting was held on January 15, 1947, to discuss the proposed coalition of the INSTITUTE with the American Chemical Society. This discussion was later written up in the form of a resolution and copies forwarded to the national officers as well as to all other chapters of the INSTITUTE.

J. DAVID REID,
Chairman

PENNSYLVANIA

The following account of the Chapter activities was compiled by our Secretary, Mr. Shull.

During the 1946-1947 season, the Pennsylvania Chapter held six technical and professional meetings at the Engineers' Club of Philadelphia. All were preceded by an informal dinner. A list of the speakers and topics follows:

Oct. 3, 1946—Dr. Foster D. Snell, President, Foster D. Snell, Inc., "Chemistry, a Profession."

Nov. 7th—Mr. George G. Schaut, former Chief Chemist, Philadelphia Water Bureau; Mr. John E. Tarman, Director, Consulting Division, W. H. & L. D. Betz, "A Symposium on Philadelphia Water."

Dec. 5th—Dr. Lloyd Van Doren, Member of Watson, Bristol, Johnson and Leavenworth, "Patents."

Feb. 6, 1947—Dr. Max Seaton, Executive Vice President, Westvaco Chlorine Products Corporation, "Chemicals from the Sea."

March 6th—Mr. George C. Collins, Manager, Marketing Research Department, Pennsylvania Salt Mfg. Company, "Marketing Surveys."

April 3rd—Mr. C. H. Van Hartesveldt, The Atlantic Refining Company, "Petroleum Lubricants."

May 9th—Plant trip to the Stetson Hat Company, Philadelphia, Penna.

The average attendance at dinner was twenty, and at the meetings, forty.

The following committees served during the past year:

Executive Committee: Dr. Francis C. Huber, Dr. Harold Tucker, Mr. Kenneth E. Shull, Mr. John M. McIlvain, Mr. Richard Wilder, Dr. Felix Gzemski, and Mr. H. A. Heiligman.

Membership Committee: Mr. Richard Wilder.

Dinner Committee: Dr. Felix Gzemski, Dr. Glen W. Hedrick.

The Executive Committee met three times during the year to discuss the general policy of the Chapter.

In view of the pending union of the A.I.C. with the A.C.S., a postcard questionnaire was sent to the membership of the Chapter to determine their views on meetings next year if the union is completed. Only twenty-one members indicated their desire to continue independent meetings. In view of these results, election of officers for the coming year was postponed until definite action is taken on the proposed union.

—Francis C. Huber
Chairman

WASHINGTON

The Washington, D. C., Chapter held four regular and one informal meeting.

October 24: Edward Wichers, "The Scientific, Industrial and Political Significance of Atomic Energy."

November 20: John Hearon, "Recent Trends and Special Methods in Biochemistry."

December 15: Informal Tea at the home of the Chairman.

January 28: Foster Dee Snell, "Chemistry—a Profession" and discussion of the merger plan.

March 25: Arthur Schroder, "Government Research and Business."

Attendance was usually rather disappointingly small, with the highest number at Dr. Snell's address. Discussions were lively and interesting, which is a better measure of the success of our meetings. The Informal Tea was so well attended that it may be recommended as a regular feature.

At the last meeting, the usual dinner preceding the lecture was replaced by refreshments served at the end of the discussion, an experiment which seemed to be worth repeating.

Plans for a joint meeting with the Washington Chemical Society had to be postponed because the prospective speakers found themselves under conflicting obligations.

A final meeting with election of new officers is planned for May 16th.

—Eduard Farber,
Chairman

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For Your Library

RUSSIAN-ENGLISH TECHNICAL AND CHEMICAL DICTIONARY. By Ludmilla Ignatiev Callaham. John Wiley and Sons. 1947. XVII, 794 pp. $10.00.

The need for a modern Russian-to-English general technical and chemical dictionary has long been felt in this country, and this volume is the first successful attempt to fill the vacancy. There have been quite a few English-Russian technical dictionaries within the last decade or two, but mainly published in the USSR and not particularly adaptable for our purposes due to the direction of the translation from English into Russian.

The author has spent more than six years in the compilation of this work, which originally was intended as a reference for chemists and chemical engineers. However, the research overlapped into so many other fields, including plastics, petroleum, physics, agriculture, pharmacy, metallurgy, biology, mineralogy, geology, etc., that it was felt desirable and practical to broaden the project into a general technical dictionary. Naturally, however, the various aspects of chemistry are given the most coverage, although sufficient attention is paid to other fields.

The volume, adequately bound in a semi-flexible cover, is very legibly and excellently printed on good paper. The Russian words are in bold-face characters with word stems clearly indicated. Translations are complete and well-equipped with synonyms and explanations. There is also a table of common Russian technical word endings and their English equivalents.

Some features which are missing, but whose presence would have enhanced the usefulness of the dictionary, include a more ample discussion of Russian grammar and case endings and some mention of the older orthography with the changes and deletions to the modern system. The latter feature is especially to be appreciated when one is investigating the scientific literature of pre-Soviet Russia. Another helpful feature would have been the inclusion of finger tabs or indentations to facilitate ready access to the desired section. The Russian alphabet, in letter form and order, is sufficiently different from English so as frequently to confuse or slow down even "scientists with a fair knowledge of Russian" for whom this volume is chiefly intended by the author.

As a whole, the volume seems quite complete and useful in fulfilling the role of a simple but fairly complete Russian-English technical dictionary. The reviewer, however, cannot help but feel that the rather high price is unfortunate and, in view of the omissions mentioned above, may adversely

affect the wide circulation of this scientifically important and vaulable work.

—LEONARD SPIALTER, A.A.I.C.

ORGANIC ANALYTICAL REAGENTS. Vol I. By Frank J. Welcher. *D. Van Nostrand Company, Inc.*, 1947. 435 pp. 6" x 9". $8.00

It is only during the last two or three decades that organic reagents have been used extensively in analytical procedures. At present, they are rapidly gaining in popularity because of their greater sensitivity and specificity as compared to inorganic reagents and also because of the greater convenience with which they may be employed in many analytical procedures.

This book and the volumes which are to follow it attempt to assemble in one place a description of all organic compounds used in the analysis of inorganic substances and to present a discussion of the methods employing reagents. It is said to cover all publications appearing prior to January 1, 1946. The foreign journals which were unavailable during the war were checked, so far as possible, through *Chemical Abstracts*.

In a classification based on functions alone, many compounds would necessarily appear in several sections. The plan adopted calls for complete treatment of each compound in one section because of the convenience of localization of information.

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The author is aware of certain inconsistencies and ambiguities which appear in various parts of the book. These difficulties arise from the contradictions and ambiguities which occur in the original literature. Inferior methods have been included for the sake of completeness.

The reviewer is unable to evaluate the claim that complete coverage of the literature has been made, but the style is clear and the book should be a valuable addition to any chemical library. There certainly is a great deal of useful material in this first volume and the lists of references are extensive.

—HOMER VAN B. JOY, F.A.I.C.

Semimicro Quantitative Organic Analysis. By E. P. Clark, *Academic Press,* Inc. 135 pp. 6¼" x 9½". $2.50.

This neat volume is a jewel for those who enjoy precision of workmanship in the laboratory. The fine points of laboratory manipulation, weighing, combustions, determination of elements, molecular weights, various organic groups, and the volatile fatty acids are very clearly described. The subject matter is of a basic nature and we await a further exposition and amplification by Dr. Clark of optical, electrical, and radioactivity methods for use in the organic laboratory.

—*J. A. Steffens, F.A.I.C.*

ATOMIC ENERGY. U. S. and U. N. Report Series 5. *U. S. Government Printing Office,* 1946. 195 pp. $0.30. (Noted in THE CHEMIST, March, 1947, p. 109).

The report contains six sections (called "volumes") of authoritative information on the present status, and some justifiable speculation as to the future, of atomic energy up to October 14, 1946. Nuclear physics and chemistry are widening the horizons of chemistry so that it is difficult for one to keep pace with developments. The bibliography contains references to 250 technical papers released between August 1945 and August 15, 1946.

We are informed by no less an authority than E. O. Lawrence that "There are indications already that the mesotron plays an important role in nuclear structure and that the protons and neutrons themselves are by no means elementary particles." According to the studies of the Monsanto Chemical Company group at the Clinton Laboratories, Oak Ridge, on "Radioisotopes in Basic and Applied Research", the production of radioisotopes of fissionable origin in the pile is about one-million times greater than in a cyclotron, and of the non-fission products, such as carbon 13 and carbon 14, about one thousand times greater in the pile. The identification of radiophosphorus by means of the tools of nuclear chemistry is 100-mil-

lion-fold more sensitive than by gravimetric methods. Thus far, isotopes of only two elements have proved to be therapeutically useful; radioactive isotopes of iodine and phosphorus. But the availability of radiocarbon opens up new methods of approach to organic synthesis, photosynthesis, and to the study of intermediary metabolism. Ionizing radiation can be used for lytic as well as synthetic processes, and a simple application lies in the prevention of the build-up of static electricity on machine parts and instruments.

Further applications of radiochemistry are being made in the manufacture of plastics, the cracking of petroleum products, and the detoxication of viruses. Each of the five technical sections is prefaced by guiding remarks by Richard C. Tolman. The sixth and concluding section on "Technological Control of Atomic Energy Activities" occupies fifty pages and is not convincing to this reviewer.

UEBER DIE MESSUNG RADIOAKTIVER ISOTOPE, *by Karl-Erik Zimens.* Transactions of Chalmers University of Technology, Gothenburg, Sweden, No. 54, 1946. 58 pp., 30 illustrations. Price, 4.50 kronor.

This is a manual of fundamentals of laboratory arrangements for electroscopic, electrometric and Geiger-Mueller counting applied to radioactivity and designed for chemists, technicians, biologists, and physicians. Technical details, instrument characteristics, limits of error, and units of measurement are discussed. The American Lauritsen electroscope receives relatively little space. A trans (t) is proposed as a unit of measure and is compared with the Rutherford (rd) and the Curie (C).

—DR. E. E. BUTTERFIELD, F.A.I.C.

The National Roster's Registration and Publications

The recent report of the National Roster of Scientific and Specialized Personnel, U.S. Employment Service, Department of Labor, Washington, D.C., shows a total registration of 61,715 chemists, of whom 4,281 are women. The doctor's degree is held by 9,715 chemists; the master's degree by 9,396, and the bachelor's degree by 34,115.

The National Roster's publications include seven pamphlets describing sixty-nine professions. Pamphlet No. 6, "Physical Sciences" is priced at 10 cents. The vocational booklet series lists "Chemistry as a Profession, No. 2" for 10 cents. The Handbook of Descriptions in Specialized Fields series includes "Chemistry and Chemical Engineering" at 30 cents. Bulletin No. 881, "Factors Affecting Earnings in Chemistry and Chemical Engineering" is published by the Bureau of Labor Statistics, and is priced at 10 cents. These publications

should be ordered from the Superintendent of Documents, U.S. Printing Office, Washington 25, D.C. Available without charge, on request to the National Roster, is "Directory of Colleges and Universities Offering Graduate Work and Some Form of Graduate Aid."

Reid Receives Herty Medal

Dr. E. Emmet Reid, Hon. A.I.C., professor emeritus of Johns Hopkins University, received the Herty medal, for outstanding contributions to chemistry in the Southeast, at ceremonies held May third at Georgia State College for Women, Milledgeville, Georgia.

"Research" said Dr. Reid, in his acceptance address, "is needed to find better methods of getting the results of research across to the people. So far the only way seems to be for the more intelligent farmers to adopt improved methods and then show them to their neighbors."

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The Pulitzer prize for "distinguished book on American history" was awarded, on May 5th, to Dr. James Phinney Baxter, 3rd, for his book entitled, "Scientists Against Time". (See review in THE CHEMIST, January, 1947).

C. S. Miner, founder and director of The Miner Laboratoires, Chicago, has been elected to the Board of Directors of Universal Oil Products Company.

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Annual Report of the Editor 1946-1947

THE CHEMIST, during this year, has published material mainly of professional (as distinguished from technical) interest. This policy was determined by the National Council as one best befitting the journal of the professional organization of chemists.

Articles published included matters of interest to the individual chemist, such as "Termination of Employment", the reports of the various committees, the classification and salary problems of the New York City chemists, licensing and legal registration, relationships between research and management, patents, etc. Other articles dealt with the new role of the scientist in political life, such as "Research, Industry and Government", "The Scientist and his Government", the "Role of the Federal Government in Scientific Activities", the "Expanding Responsibilities of the Scientist", and similar material. Information concerning the activities of the INSTITUTE and its Chapters was featured, such as the proposed coalition, the papers and subjects discussed at Chapter meetings and actions taken by the Council. Authors have not been restricted to "Big Names". Though THE CHEMIST has published articles by outstanding men, it has also printed papers by less-known chemists who have an equally important message.

Reader response to THE CHEMIST has been outstanding this year, and many letters were received. The symposium type of article seems to inspire an unusually good response. Two symposiums were published: "Should the Supply of Chemists Be Regulated" and "If I Could Renew My Education". Others are scheduled for summer publication.

To make the editorial policy of THE CHEMIST more clear, it may be enlightening to quote from two letters. The first states:

> "THE CHEMIST . . . must be unique . . . in having no declared editorial policy—not even any editorials. It began to fall apart as the official organ of a professional group when it abandoned all expression of an editorial point of view."

The second letter reads:

> "There have been two groups in the A.I.C. and they have both been heard from time to time in articles in THE CHEMIST and through actions of the different chapters. This is a healthy situation . . . and just the opposite to that of (publications) where individual expression upon professional and social matters has been suppressed . . . If the A.I.C. does nothing more than offer a publication where professional and social questions of the day may

be decently and temperately debated by scientists and without editorial comment or interference, it will be fulfilling a mission worthy of its existence."

These two letters demonstrate how differently the same thing can appear to two different persons. The first requires the statement that the editorial policy of THE CHEMIST is to keep chemists informed on matters affecting the professional side of chemistry and, in addition, to cover the activities of the INSTITUTE. The second letter more nearly expresses the desire of the editorial policy to inform on all matters concerning the profession.

Recently, there has been a request by one of the chapters to include semi-technical articles in THE CHEMIST to contrast with the heavier professional material, on the premise that chemists want something directly referring to science to make them "feel at home" when reading their journal. There are other publications which adequately cover such material, but if there is sufficient demand on the part of our readers, the matter will be further considered by the Council, because in the final analysis, the members of the INSTITUTE may have any editorial policy which they desire. The matter of space must be mentioned. We could use many more pages on professional material alone. It is hoped that through the cooperation of INSTITUTE members, THE CHEMIST may be enlarged this year. It is not to be expected that every person will be interested in everything printed in each issue of THE CHEMIST. Chemists permeate so many fields; serve in so many capacities, from that of the young man in his first industrial position to that of the president of the corporation; and from the chemist in the government laboratory to the chemist as teacher or college professor, or in many other fields, that the same articles cannot appeal to all. But in every issue, there should be something of interest to each reader, either because what affects all chemists affects him to some degree, or because it concerns some phase of his own career, or because of the new importance to society assumed by all scientific men.

Articles which appeared in THE CHEMIST were reprinted in a number of other magazines, and even in books in two cases. The circulation of THE CHEMIST increased more than ten per cent over that of the preceding year. In addition to INSTITUTE members, hundreds of libraries and individuals subscribe. The high-quality of our INSTITUTE membership confers on the publication a value which is far greater than that indicated by its circulation. It is well known that the leaders in the profession influence far more persons than they themselves number. For this reason, ideas and information dispensed through THE CHEMIST reach, in effect, far beyond

its mailing list. Our advertisers, too, appreciate this quality-circulation.

There have been a large number of calls for special issues containing articles of interest to young men considering the profession, such as the requests from vocational bureaus for veterans.

Our thanks go to Dr. Foster D. Snell and to the other officers and councilors of the INSTITUTE for their assistance and support; to the Chapter officers and reporters who supply material; to Dr. Gustav Egloff, who regularly suggests professional material; to Dr. Raymond E. Kirk for his cooperation; to the members who send in personal items concerning themselves or their friends; to our advertisers for their support; to the authors of articles and other material, and to all who by their letters serve to keep us informed.

—V. F. KIMBALL, *Editor*

—T. S. MCCARTHY, *Man. Ed.*

Research At Heyden In 1946

The planned expansion of the corporation has necessitated extensive work on new processes and new products within the field of intermediates for pharmaceuticals, plastics, dyes, and insecticides, also antibiotics. In order to do this work effectively it has been necessary for the corporation to increase materially its facilities and enlarge its staff. The co-ordination of its research units during the last year has been very effective, and the corporation is looking forward to even greater accomplishments by its research staff.

—ANNUAL REPORT 1946
Heyden Chemical Corp.

History of Sciences Museum Seeks Funds

The Museum of the History of Sciences, Florence, Italy, is seeking funds to restore war damage incurred when the Via de'Bardi was blown up. The Museum contains the remains of the scientific work of Galileo, Toricelli, and Redi, as well as the works of other members of the Academy of the Cimento, the first modern scientific society. Information may be obtained from Marvin Lee, vice president of the Burndy Library, 107 Bruckner Boulevard, New York 54, New York.

Dr. Vladimir N. Ipatieff, F.A.I.C., director of chemical research, Universal Oil Products Company, Chicago, and Mrs. Ipatieff have made available, through the American Chemical Society, the Ipatieff Prize in Chemistry. This award has a value of approximately $3000. It is designed to recognize outstanding chemical experimental work in the field of catalysis or high pressure carried out by men or women of any nationality who are not over forty years of age.

Chemical Condensates

Ed. F. Degering, F.A.I.C.

Blackberries, dewberries, raspberries, and strawberries, according to definition, says David R. Rodney, of Ohio State University, are not berries at all. According to botanists "a fruit is a berry only when it is formed by the enlargement of the pistol, the parts of which remain fleshy and succulent when mature." Irespective of terminology, they are still good eating when properly coated with cream and sugar.

* * *

"There are more things that we do not know how to do than there are things that we have accomplished." —WILLIAM M. RAND, *President, Monsanto Chemical Co.*

"Acetic acid," according to Dr. Konrad E. Block of Columbia University, "has only recently been recognized to be of primary importance in the body's metabolism."

* * *

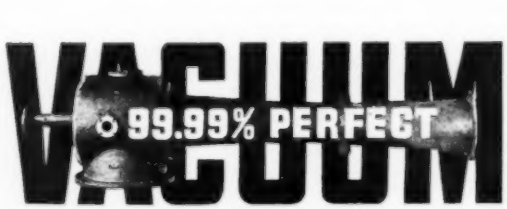
The Calutron, built by Westinghouse Electric Corporation, is an electrical sorting machine used in the isolation of uranium 235.

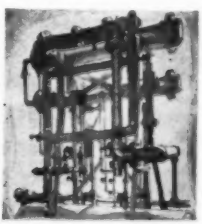
* * *

Lubricants containing proper wetting agents are reported to decrease the rate of wear in engines.

* * *

According to latest estimates, World War II cost the world 1,352 billion dollars and 25 million lives.





This degree of vacuum referred to the average sea level barometer is maintained by the Croll-Reynolds five stage steam jet EVACTOR. If five stages sound complicated consider the fact that there are absolutely no moving parts. Each stage from a mechanical standpoint is as simple as the valve that turns it on. Numerous four stage units for maintaining industrial vacuum down to 0.2 mm. and less, and many thousands of one, two and three stage units are maintaining vacuum for intermediate industrial requirements on practically all types of processing equipment.

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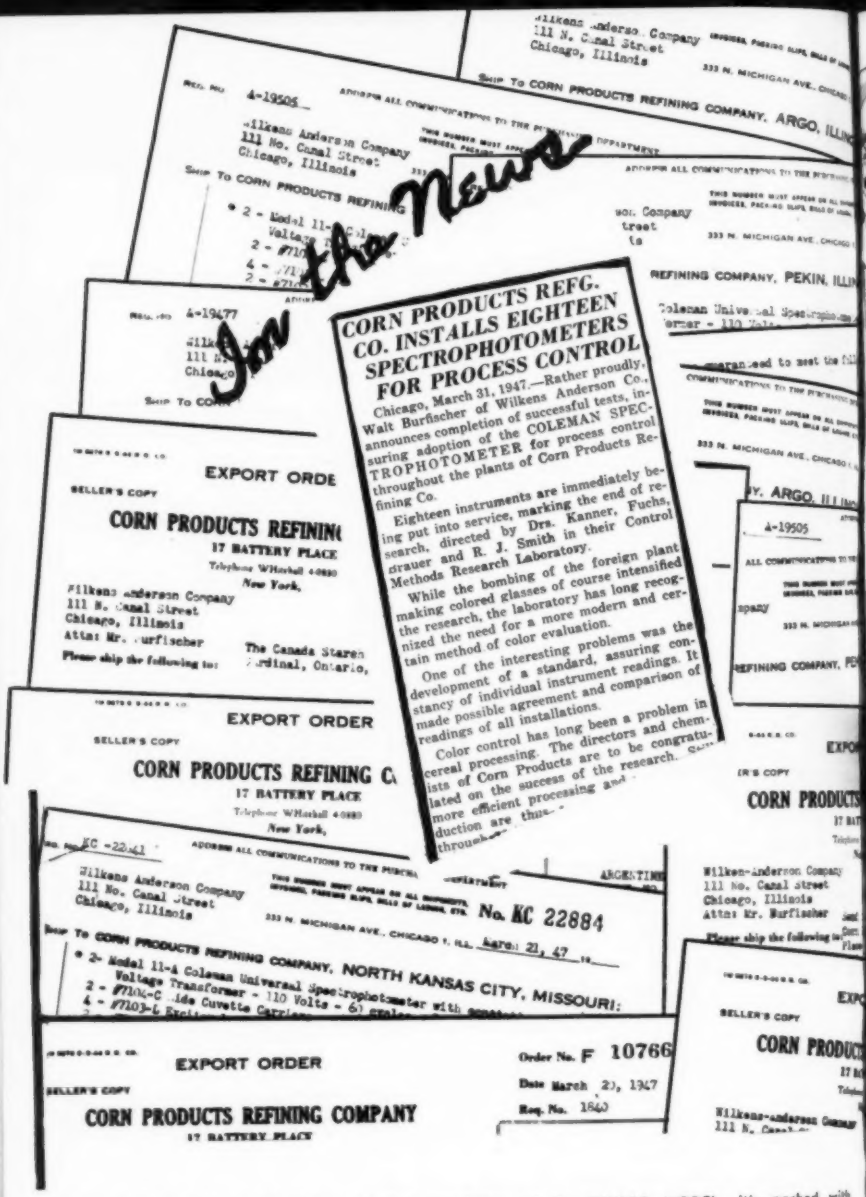
* * *

The soaking of seed corn develops an electrical potential that may be utilized in determining the sproutability of the corn.

"Research," according to Assistant Director G. D. Beal of Mellon Institute, "is curiosity set to thinking."

* * *

The application of polarized light to photography and projection will permit of three-dimensional pictures on screens.



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